國立政治大學資訊管理學系博士

電子商務環境供應鏈供需互動模式之研究
The Interactive Supply-Demand Model for Supply Chain in Electronic Commerce

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中文摘要

在電子商務的環境中，透過資訊科技的使用與通訊網路的連結，將會有愈來愈多的產品或服務需求者透過新興的電子化媒體 (如網際網路) 來尋找可行的交易互動夥伴，進而完成交易。因此，交易結構每一份子間的互動關係，將面臨新的衝擊與挑戰。而納入電子商務觀念的供應鏈管理，將是以資訊科技與通訊技術為基礎的新領域，在此一領域中，供應鏈可以簡單地概念化成三部份：即產品/服務的供給者 (賣方)、產品/服務的需求者或是消費者 (買方)、及提供兩者溝通服務的資訊服務提供者。而在三者間，除了存在著生產與配送過程中既有的物料流/產品流、服務流及完成交易所必須的金流之外，更重要的是還有提供控制機能的資訊流。如何有效地管理與利用資訊流便成為供應鏈管理成功與否的關鍵性因素，而企業也因此產生了對於資訊服務的需求。

因此，本論文的目的在於發展出一個完整的研究體系，以針對傳統供應鏈中之供需雙方與資訊服務業之間的關係，發展出一個供需互動模式，以使電子商務環境中資訊服務的供需雙方能夠據此制定重要的決策與策略。此一體系包含了以下三個子體系：概念體系、評估體系、以及規劃體系。在概念體系的部份，本研究將透過文獻探討，針對供應鏈中的供需者 (可被視為資訊服務的需求者) 與資訊服務提供者，發展出一個整合的概念性互動模式，此一模式將解釋各個體之目標與其行為屬性，而這些目標與屬性也將成為後續評估及規劃體系發展的基礎。而後續兩個體系的發展，將以資訊服務的供需互動為研究主體。就評估體系而言，本研究將分別使用加法型 (層級分析法) 與非加法型 (模糊積分法) 方法來發展評選資訊服務提供者的多準則決策模式。而根據上述的結果，決策者便可針對其手邊現有的可選擇方案，來進行評選。一旦評選結果確定之後，決策者便可與其進行後續的供需互動。至於規劃體系的部份，則是要分析供需雙方如何根據自身的目標與資源限制，經由資訊的分享與交換，與所選取的夥伴進行互動。根據供需關係的型態及供需互動的主導者這兩個分類的標準，本研究將供需互動分成四種不同的狀況來探討。而透過模糊二階多目標規劃模式與多階段解題流程圖的應用，我們可以分析供需單位間如何透

過資訊的交換以進行互動，並解釋互動所可能出現的結果，亦即失敗或成功。最後，本研究也將使用一個簡例來說明模式的可用性。

關鍵字：電子商務; 供應鏈管理; 多準則決策; 模糊測度; 模糊積分; 模糊二階多目標規劃

Abstract

In the environment of Electronic Commerce (EC), there are more and more demanders of products or services looking for available interactive partners of transaction through the burgeoned electronic media (such as the Internet), who then complete transactions with the use of information technology and the connection of communication networks. Therefore, the interactive relationship between each member in the transaction structure will face new poundings and challenges. And the supply chain (SC) management, which fits into the notion of EC, will be a new field based on information technology and communication infrastructure. Within this field, the SC can be simply conceptualized into three parts: (1) Those act as the suppliers of products and services (the sellers), (2) The demanders or consumers of products and services (the buyers) and (3) the information service provider (ISP) which provides the information service for both parties. Among these three parties, in addition to the material/product flow and service flow existed in the production and distribution processes together with the financial flow required of accomplishing transactions, what is more important is the information flow that provides control function. Thus, how to effectively manage and use information flow becomes a key factor for successful SC management. As a result, the needs from enterprises for information service arise.

This dissertation aims to establish a complete research system which helps develop an interactive supply-demand model for SC in EC, especially focusing on the relationship between the demanders and suppliers of information service. The research system includes three sub-systems: system of conceptualization, system of evaluation and system of planning. The system of conceptualization develops an integrated conceptual model to depict the interactive supply-demand relationship within SC. This model explains the objectives and the behavioral attributes of every individual, which then become the foundation of follow-up development of the systems of evaluation and planning. As for system of evaluation, this paper uses both additive (Analytic

Hierarchy Process) and non-additive methods (Fuzzy Integral) to develop the multiple criteria decision making model for evaluating and selecting ISPs. In accordance with the results above, decision-makers are able to evaluate and select from alternatives on hand. Once the evaluation result is confirmed, decision-makers can proceed with the follow-up supply-demand interaction. As for the planning system, analysis of how supplier and demander of information service interact with each other according to their objectives and resource constraints is carried out. This dissertation also divides the supply-demand interaction into four different situations according to the type of relationship and the dominance. Through the application of fuzzy bi-level multiple objective programming (fuzzy BLMOP) technique and the multi-stage problem solving flow chart, we can analyze how the supply and demand units interact with each other by exchanging information and the possible outcomes of interactions can be explained. Finally, this dissertation illustrates the applicability of the fuzzy BLMOP model with a simple example.

Key words：Electronic Commerce; Supply Chain Management; Multiple Criteria Decision Making; Fuzzy Measure; Fuzzy Integral; Fuzzy Bi-level Multiple Objectives Programming